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ABSTRACT

These instructional objectives, written by Norman E. Rich, have been selected from materials used at Golden West College (California). These objectives are offered simply as samples that may be used where they correspond to the skills, abilities, and attitudes instructors want their students to acquire. These objectives may also serve as models for assisting instructors to translate their courses into specific measurable terms. For other objectives in related courses see: ED 033 711 (Physiology [first semester]); and ED 049 753 (Introduction to Physiology). (MB)

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Instructional Objectives for a Junior College Course in Human Anatomy-Physiology

Anatomy-Physiology 1A and 1B
Instructor: Norman E. Rich
Golden West College
Huntington Beach, California

Text: Guyton and Crouch,
Functional Human Anatomy

Lab. Manual: Kneal and Kalbus,
Laboratory Manual for
Human Anatomy and Physiology

JC 720 208

UNIVERSITY OF CALIF.
LOS ANGELES

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1972

GOLDEN WEST COLLEGE
Anatomy-Physiology 1A
Fall, 1969
Mr. N. Rich

BEHAVIORAL OBJECTIVES -- Week Two

BE ABLE TO:

1. Match a bad listening condition with a key phrase or word from one of the ten poor listening habits.

2. Select from a list of items which will be provided, those things which specifically apply to the lives of the following men and the contribution each man has made to human anatomy and/or physiology:

   Andreas Vesalius, Hippocrates, Aristotle, Galen, William Harvey, Semmelweis.

3. List ten anatomical inaccuracies which were propagated through the years until Vesalius arrived to correct them and place them in proper perspective.

4. List three general similarities that different fields of medicine (i.e. anatomy - physiology - anesthesia) have had in the introduction of new concepts and the developmental process of these concepts.

5. List eight different traditions or superstitions which have or might have a tendency to inhibit scientific progress.

6. Write a definition for each term in the syllabus covering the material for this week or match the term with a given definition.

7. Use all terminology in the syllabus accurately in a sentence describing anatomical structure or body orientation. (i.e. The hand is distal to the wrist.)

8. List the cavities in the dorsal and ventral cavities and also list the cavities of the anterior portion of the head.

9. Match or designate which organs of the body are found in which respective cavity of the body.

10. Locate, without the aid of a text, the regions of the body as outlined in your workbook.

NOTES:

BEHAVIORAL OBJECTIVES -- Week Two

BE ABLE TO:

11. Define or recognize stated definitions pertaining to the metric system terminology and solve problems which necessitate the ability to convert millimeters, grams, the metric system, etc. to inch-pounds of the English system, etc.

12. List the ten systems of the body and identify the major organs and structures in each system.

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BEHAVIORAL OBJECTIVES -- Week Three
MICROSCOPY

BE ABLE TO:

1. Label a microscope using all terms included in your syllabus and give the function of each part, or match the part of the microscope with the definition of function which will be provided.

2. Use the microscope in identifying various structures as given in your workbook.

3. Use the microscope in observing the difference between 3 major tissue types.

4. List the steps followed in the preparation of wet microscope slides for viewing and be able to prepare wet microscope slides.

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BEHAVIORAL OBJECTIVES -- Week Four
CELL STRUCTURE AND FUNCTION

BE ABLE TO:

1. Accurately use the terms of this section in sentence form or match the terms with a definition which will be provided.

2. List and define the nine properties of life which will be discussed with you.

3. Define the term Homeostasis, which applies to all functional systems of the body, by using the following terms:
Anabolism, Catabolism, Atrophy, Hypertrophy, Metabolism, and Feed-back.

4. List the fourteen cell structures and organelles of a typical cell and give a brief definition of the function of each.

5. Recognize different modifications of the typical cell as viewed from slides in the lab.

6. Illustrate the functional relationship of the cellular structures and organelles by matching the function with systemic terms. (i.e. circulation, excretion, digestion, etc.)

7. Diagrammatically draw and label the microstructure of the cell membrane and demonstrate your understanding of cell microstructures by indicating what, why and how some particles will pass through the membrane wall and others will only pass through the pores of the membrane.

8. Demonstrate your understanding of cell microstructure by outlining the two postulated theories of cell evolution.

9. Observe and draw valid conclusions from demonstration experiments which illustrate basic principles of molecular action influencing membrane transport.

10. Describe active transport and explain the mechanism model as illustrated on page 54 of your text.

11. Solve all problems to be discussed from your workbook.

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BEHAVIORAL OBJECTIVES -- Week Five
CELL FUNCTION (continued) AND DIVISION

BE ABLE TO:

1. Differentiate between mitosis and meiosis regarding time of occurence, place of occurence, and end product as a result of the divisions.

2. Label the microstructures of chromosomes.

3. Label, draw, and identify the various phases of mitosis and correlate this process with protein synthesis and DNA replication.

4. Recognize by responding to objective questions the process and sequence of protein synthesis.

5. Designate or recognize a description of the chemical composition of the DNA molecule and describe by writing or by answering objective test questions, or verbally, the chemical arrangement of an intact DNA molecule.

6. Relate the process of DNA replication to the whole cellular mechanism of replication, particularly to chromosome replication.

7. Illustrate and explain the process by which the DNA code is transcribed into construction of a protein molecule.

NOTES:

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BEHAVIORAL OBJECTIVES -- Week Six
INTRODUCTION TO EMBRYOLOGY AND TISSUES

BE ABLE TO:

1. Define or recognize definitions of all terms in your syllabus for this section.
2. List and differentiate between the various levels of organization.
3. List in sequence and describe the various embryological stages of development and be able to identify these various stages in prints, 35mm slides, and microscope slides.
4. List the three embryonic germ layers and list the body derivatives which arise from the respective germ layers.
5. Identify, with models, all of the early embryological stages.
6. Draw and label the embryological step of development in the human.
7. Name the 3 major intra-uterine periods and give the average duration of each period and the weight of the developing fetus.
8. List and define the 4 general functions of tissues.
9. Recognize or differentiate between all tissues identified in lab with the aid of a microscope without the aid of a text.
10. Give the location and function of all the tissue types observed in lab, and in your workbook.
11. Solve all problems that we will discuss in your workbook.

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BEHAVIORAL OBJECTIVES -- Week Seven
INTEGUMENT AND AXIAL SKELETON

BE ABLE TO:

1. Use the terms provided in the syllabus to identify and label charts which represent structures of the skin and axial skeleton.
2. List the functions of each structure of the integument (skin).
3. Differentiate between negroid and caucasion skin.
4. Differentiate between the structure composing hair as listed on page 21 of your syllabus and detail the orgin of hair.
5. List and define the 3 kinds of hair.
6. Specify, by name and function, all of the derivatives of the skin.
7. Differentiate between exoskeleton and endoskeleton.
8. List and name examples of the 4 types of bone.
9. List five major functions of the skeletal system.
10. Differentiate between the axial and appendicular skeleton.
11. Identify the structures of the axial skeleton as listed in the syllabus and define each term.
12. Give the location of each axial skeletal bone of a disarticulated skeleton and list the bones of the body with which it articulates.
13. Solve all problems discussed in your workbook.

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BEHAVIORAL OBJECTIVES -- Week Eight
APPENDICULAR SKELETON

BE ABLE TO:

1. List and explain the sequence of events which occur in the transition of mesenchyme to endochondral and intramembranous bone.

2. Single out comparisons or relationships between the microstructure of bone and the developmental process of bone.

3. Identify all parts of the appendicular skeleton, listed in your syllabus, on a disarticulated skeleton, list the articulations of each bone, and identify the bone as to which side of the body the bone is located.

4. List and define seven abnormalities of the skeleton and give the probable cause or causes of the abnormality.

5. Differentiate between the spinal curvatures (primary & secondary) in the infant and adult and list reasons for the need of a vertebral change.

6. List and define several types of fractures and specify the four stages in the healing process.

7. Use an X-ray film to determine which bones are malformed or broken, which you can list from objective #6.

8. Solve all problems discussed in your workbook.

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BEHAVIORAL OBJECTIVES -- WEEK NINE
SKELETON COMPARISONS, JOINTS, AND LEVERS

BE ABLE TO:

1. Define all terms and solve all problems in the syllabus, workbook, and handout for this section of material.

2. Differentiate and list the differences between an adult skeleton and an infant skeleton.

3. Differentiate the differences between males and females, particularly in reference to the skull and pelvic girdle.

4. List and define the three major joint types and the sub-types listed under each type.

5. List and give the function of the major structures of a synovial joint.

6. Differentiate and give examples of the three (3) major level classes.

7. Solve problems involving the three lever classes.

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BEHAVIORAL OBJECTIVES -- Week Eleven
MUSCLE STRUCTURE AND LOCATION

BE ABLE TO:

1. Define all terms and solve all problems in your syllabus and workbook for this section.
2. Identify on diagrams and recognize descriptions of the microstructure of the three general muscle types.
3. Give the name, location, and function of all the muscles in the syllabus and workbook.
4. Identify the muscles on the preserved speciman dissected in lab. (i.e. cat, fetal pig, or mink) and charts which will be provided.
5. Differentiate between an origin and an insertion of a muscle.
6. Differentiate between the various types of movement as illustrated on page 33 of your atlas, and give examples of each type.
7. Differentiate between and give examples of primb movers, antagonists, synergists, fixators.

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BEHAVIORAL OBJECTIVES -- Week Twelve
MUSCLE BIOCHEMISTRY AND MICROSTRUCTURE

BE ABLE TO:

1. Define all terms and solve all problems in your workbook ans syllabus for this section.
2. List and properly arrange the 3 basic structures of an ATP molecule.
3. Differentiate between glycolysis and the Citric Acid cycle with major emphasis on ATP formation, structure, and utilization.
4. Draw and explain the model of protein, fat and carbohydrate utilization in cellular metabolism.
5. List and analyze 2 theories which account for muscle contraction as given on page 71 and 72 of your text.
6. Analyze muscle contraction in terms of the energy cycle, ATP, Myosin, Actin, ATPase, Calcium, T-Tubules, and fine reticulum.
7. Identify by definition and recognition on an objective exam, the 4 types of heat as a result of muscle contraction.
8. Determine or calculate the cellular efficiency factor.
9. Determine the amount and type of muscle work. (Review)
10. Properly set up a kymograph prior to muscle physiology analysis.
11. Pith a frog and extract the gastrocnemius muscle.
12. Use and set up the IMP scope in determining functions of muscles as will be discussed and identified for you.

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BEHAVIORAL OBJECTIVES -- Week Thirteen
MUSCLE CONTRACTION; NERVE & MUSCLE IMPULSE CONDUCTION

BE ABLE TO:

1. Differentiate between the basic nerve structures as listed on page 58 of your text.
2. List the conditions which exist in the production of a membrane potential.
3. List several factors which will cause depolarization of a nerve or muscle membrane.
4. Describe in detail, the various steps which transpire in the transmission of the depolarization wave in the nerve or muscle impulse.
5. Differentiate between the transmission impulses of nerve, skeletal muscle, cardiac muscle, and smooth muscle as described on pages 64-66 of Guyton.
6. List and describe the changes which occur at the neuromuscular junction and differentiate between the effects of acetylcholine, cholinesterase, curare, neostigmine and neostigmine-like drugs.
7. Demonstrate, by using the kymograph and physiograph, your complete understanding of thresholds, length of contractions, phases of muscle contraction, strength-duration analysis, and all concepts of muscle contraction as outlined in your workbook and in various sections of our discussion.

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BEHAVIORAL OBJECTIVES -- Week Fourteen
DIGESTIVE STRUCTURE AND ORIENTATION

BE ABLE TO:

1. Define all terms and solve all problems in your workbook and syllabus for this section.

2. List in order the 6 major regions of the digestive system.

3. Identify 6 major properties or structural roles of the digestive system by recognizing a description of the significance of each of the 6 concepts to the digestive process.

4. Identify the 2 major divisions of the digestive system by listing the structures and associated glands of each division.

5. List the general physiological function or mechanical function of each structure of the digestive system listed in your syllabus beginning on page 50.

6. List the basic components of saliva besides identifying the general role of each digestive structure asked for in objective number 5.

7. List the 4 major layers of the gastro-intestinal tract, and the 3 sub-layers of the mucous membrane.

8. Identify with the aid of a microscope, drawings, and descriptive terms, the micro-structure and gross structure of all parts, to be discussed in the digestive system.

9. Identify the digestive structures on a preserved specimen as listed in your syllabus and workbook.

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BEHAVIORAL OBJECTIVES - Week Fifteen
DIGESTIVE BIOCHEMISTRY

BE ABLE TO:

1. Define all terms and solve all problems defined in your syllabus and workbook for this section.
2. List the major digestive juice, the enzymes of each juice, the pH requirement of each enzyme, and the digestive action of each enzyme, as listed on page 57 of your syllabus.
3. List the 4 major properties of mucus which is secreted by every section of the gastrointestinal tract.
4. Describe and recognize descriptions of the hormonal and neurogenic salivary, gastric, pancreatic, pancreozymin, bile, and small intestine secretions as presented in your text.
5. List the 3 phases of salivary secretion gastric secretion, and identify events which occur in each phase.
6. Show understanding of gall stone production by recognizing a description of their formation and answering objective questions about gall stones.
7. Analyze the digestive process of carbohydrates, proteins, and fats from a biochemical standpoint, and draw parallels between digestion and the absorption mechanism.
8. Give the digestive sequence for fats, proteins, and carbohydrates.
9. List ways in which the three basic foods are utilized and stored.
10. List and describe the functions of the liver as related to digestive processes as will as other body functions.

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BEHAVIORAL OBJECTIVES - Week Sixteen
METABOLISM

BE ABLE TO:

1. Give the body requirements of the 3 basic foods.
2. List the major vitamins as given in your text and identify the source of the vitamin, the physiological role of the vitamin, and the symptoms resulting from a deficiency of each vitamin.
3. List three general causes of vitamin deficiency.
4. Differentiate between long-term and short-term regulation of food intake.
5. Distinguish between the surface to volume ratio phenomena in small animals as compared to large animals.
6. Define or recognize a definition of BMR and list the conditions of the body necessary to measure the BMR.
7. Differentiate between the direct, indirect and estimated measurement of BMR.
8. Solve problems of BMR based on the following two method: 1. the amount of heat loss per square meter of body surface and 2. the amount of calories burned per liter of oxygen.
9. List several ways utilized to lose weight.
10. List and recognize a definition of the four processes by which heat is lost from the body.
11. Map and estimate the number of sweat glands of the body and draw a parallel between the number and tendency to lose heat by evaporation.
12. List and describe the processes which influences the increase of body temperature.
13. List and describe the processes which influences the decrease in body temperature.
14. Draw and differentiate between the different phases involved in the cycle of an occurrence of a fever and the return to normal body temperature.

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BEHAVIORAL OBJECTIVE -- Week One
EXCRETORY STRUCTURE

BE ABLE TO:

1. Differentiate between the urinary structures as excretory sturctures and sudoriferous glands in water balance and body temperature control.

2. Identify the structures of the urinary system by listing the name or matching the name with the structure ON the following:
   A. General orientation of the kidney and associated structures.
   B. Gross structure of the kidney and associated structures.
   C. Microstructure of kidney (eg. nephron)

3. Identify and name the gross structure and microstructure of the excretory system with the aid of the:
   A. Dissectable torso
   B. Fetal pig
   C. Kidney and nephron models
   D. NTA Micorscope
   E. Microscope with kidney tissue
   F. Classroom charts

4. Trace the flow of blood through the kidney.

5. Trace the pathway of fluid (tissue) through the kidney from the point of its origin at the Bowman's Capsule to the external environment.

6. Define or identify a definition of all the terms in your syllabus and workbook pertaining to excretory system structure.

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BEHAVIORAL OBJECTIVES -- Week Two

Excretory Function

BE ABLE TO:

1. Name and define (or recognize a definition of) the different types of body fluids.
2. Give the total volume for each fluid type in the body, in the average 70 kilogram man, and identify the percent volume of each.
3. Conclude the volumes of each type of body fluid by analyzing experimental data derived from an actual measurement. (eg. Experiments on page 182-183 of Guyton.)
4. Differentiate between capillary pressure and tissue pressure and identify the approximate value of each.
5. Compose a definition of colloid osmotic pressure (C.O.P.) and resolve problems designed to influence fluid volumes as a result of the difference between the C.O.P. and capillary and tissue pressures.
6. Designate the direction and how fluid flows through the tissues from data giving the arterial and venour capillary fluid pressures, colloid osmotic pressure and tissue pressures.
7. List and define the function of the lymphatic system and describe the process by which the lymphatics form.
8. Define and give examples of the "dry" state of the body and the relationship to edema.
9. List the special fluid systems in the body as given on page 191-194 of your text. (ie. Fluid spaces, system of the eye, cerebrospinal fluid)

NOTES:

(Behavioral Objective - Week Two)
(Excretory Function)
2.

NOTES:

10. Draw a parallel between the nephron function and tissue fluid formation and maintenance as discussed in the previous objectives. (Include a complete explanation of glomerular filtration.)

11. Identify the role of the juxtaglomerular apparatus in the autoregulation of glomerular filtration.

12. Trace the micturation reflex. Compare the artificial kidney function with normal kidney function.

13. List three possible mechanisms which controls sodium ion balance in the kidney.

14. Identify the role (ie. by answering objective questions) of the kidney in the following:
A. "Counter-current" mechanism;
B. Acid-base balance regulation;
C. Blood volume;
D. Extra cellular fluid volume;
E. Intracellular fluid volume.

15. Solve and analyze the data of all experiments in your workbook (as will be indicated).

16. Define or recognize a definition of all terms in your syllabus.

17. NOTE: All of the objectives pertaining to chapters 16, 17, & 18 in your text.

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BEHAVIORAL OBJECTIVE -- Week Three
REPRODUCTIVE STRUCTURE

BE ABLE TO:

1. Identify as many as possible of male and female structures on the:
   A. D-G anatomy test sheets
   B. Turtox classroom charts
   C. Frohse classroom charts
   D. Mannequin
   E. Fetal pig
   F. Reproductive models

2. Answer objective questions regarding structure, location, and function of male and female reproductive structures as listed in your syllabus and workbook and discussed on tape.

3. Recognize and identify the microstructure of the reproductive structures with a microscope and by discription.

4. Trace the pathway of a sperm cell from its origin to the point of conception.

5. Trace the pathway of the fertilized egg to the point of implantation.

6. List the components of semen and give the origin and function of each component.

7. Trace the embryological migration of the testes, list structures which still are present to indicate this migration, and list and define disorders which result from an improper or incomplete migration.

8. List 10 homologies of the male and female reproduction structures.

9. Solve all workbook exercises and define all syllabus terms.

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BEHAVIORAL OBJECTIVE -- Week Four
REPRODUCTIVE FUNCTION

BE ABLE TO:

1. Draw a model, or analyze a diagrammatic model which will be provided, of the menstrual cycle

2. Relate structuial changes of the female reproductive system as a result of hormonal secretions in the menstrual cycle.

3. Identify the site of action of contraceptive pills and list the effects in preventing pregnancy after you understand the menstrual cycle (objective 1 and 2), and be able to list and describe ways to regulate periods of pregnancy (family planning).

4. Compare the hormone effects on the male reproductive system as compared to a hormone by the same name in the female.

5. List 7 general causes of infertility in the male and 9 general causes of infertility in the female.

6. Draw and label the phases of mitosis. (Review objective from A-P 1A).

7. Draw and label the phases of meiosis and contrast this division process with mitoses as to the following:
   A. Chromosome number
   B. Types of division at different phases
   C. DNA replication
   D. Number and type of cells produced
   E. Location of division process

8. Differentiate between male and female meiosis and subsequent gamete formation.

9. Identify maturing sperm and egg cells by naming them according to the respective stage of development. (eg. spermatogonium or oocyte).

10. Solve all workbook problems and define all syllabus terms.

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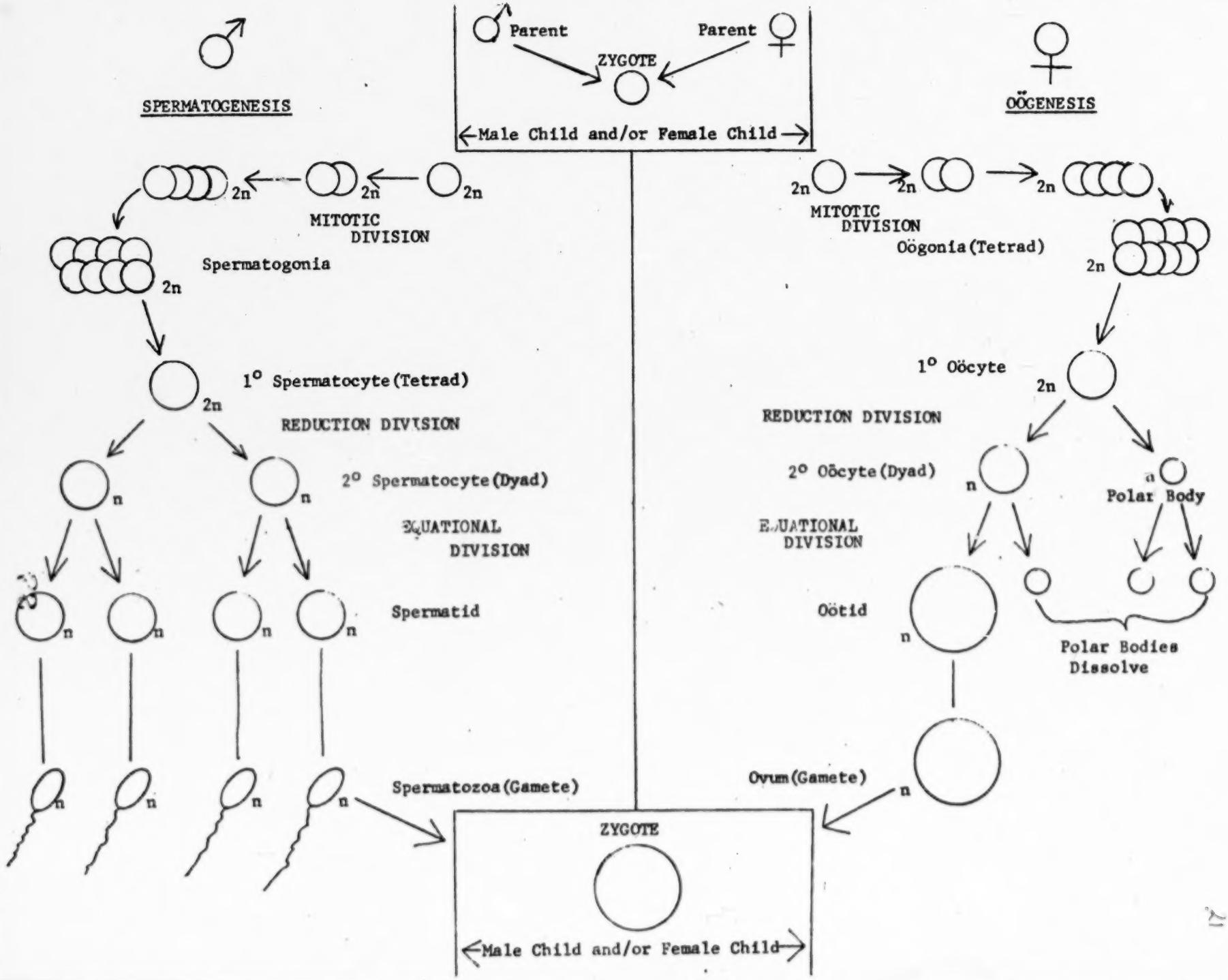
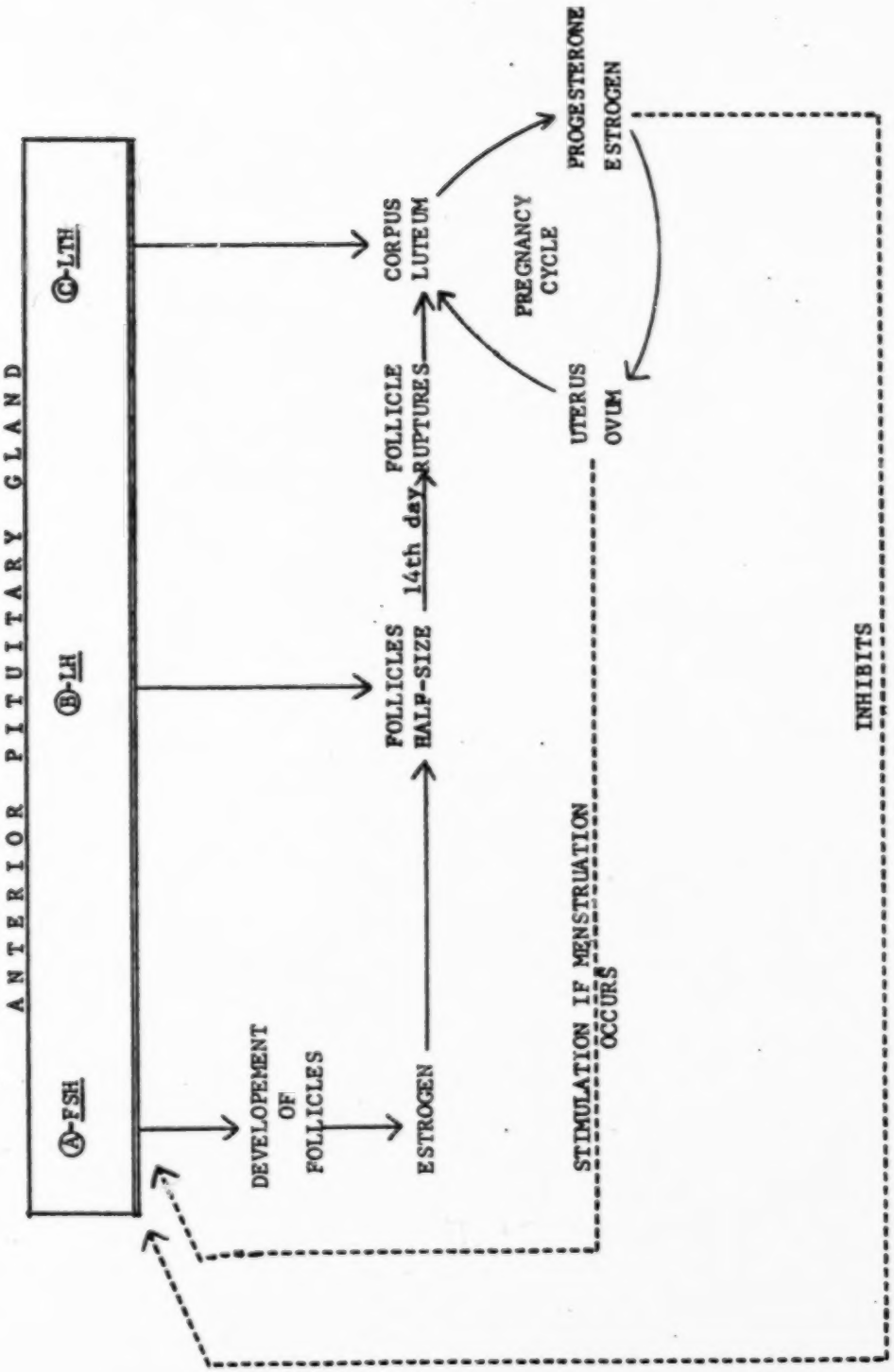
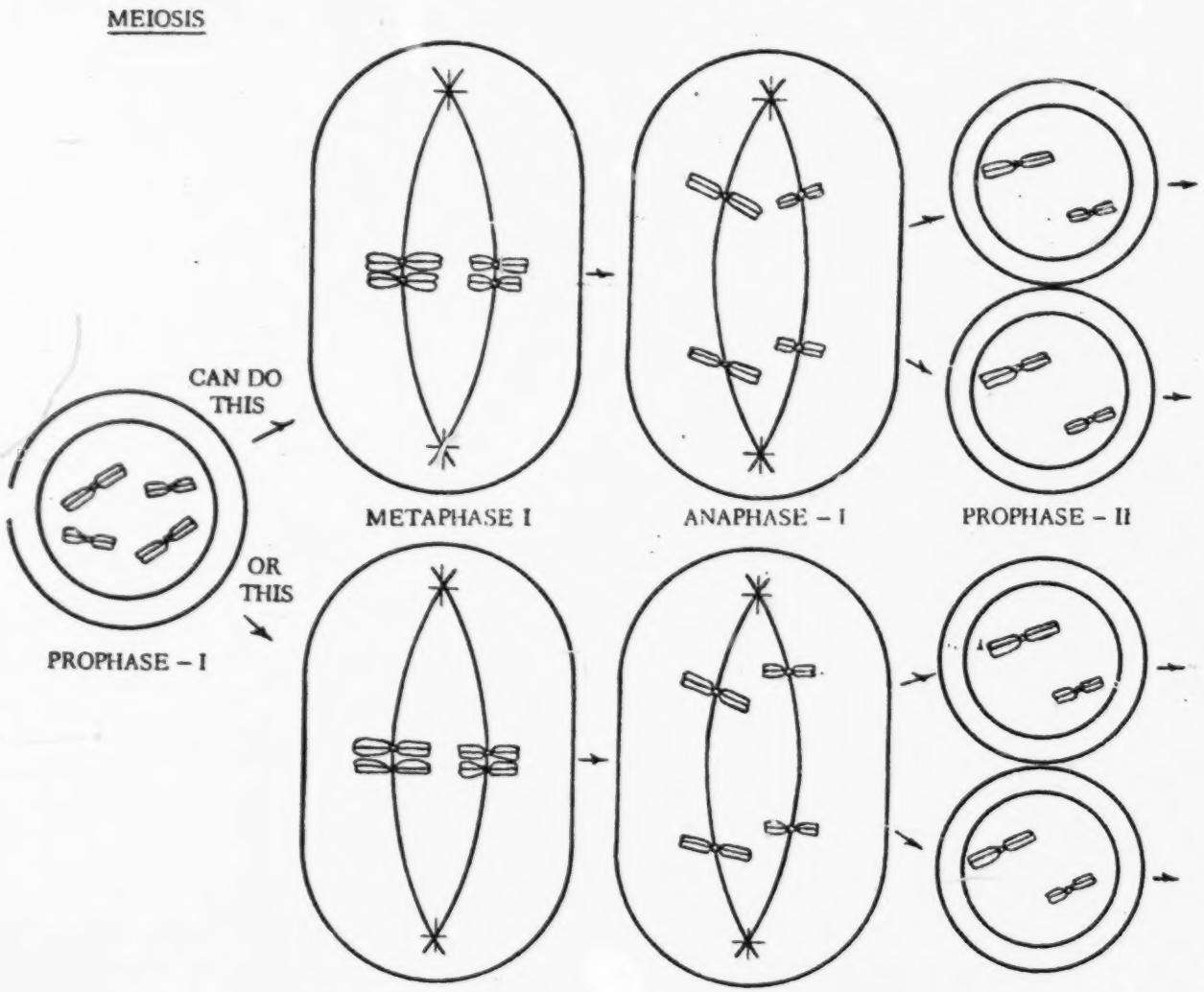

Parent
Parent
ZYGOTE
Male Child and/or Female Child
SPERMATOGENESIS
OÖGENESIS
2n
MITOTIC DIVISION
Spermatogonia
Oögonia (Tetrad)
1° Spermatocyte (Tetrad)
1° Oöcyte
REDUCTION DIVISION
2° Spermatocyte (Dyad)
2° Oöcyte (Dyad)
n
EQUATIONAL DIVISION
Polar Body
Spermatid
Oötid
Polar Bodies Dissolve
Spermatozoa (Gamete)
Ovum (Gamete)
ZYGOTE
Male Child and/or Female Child

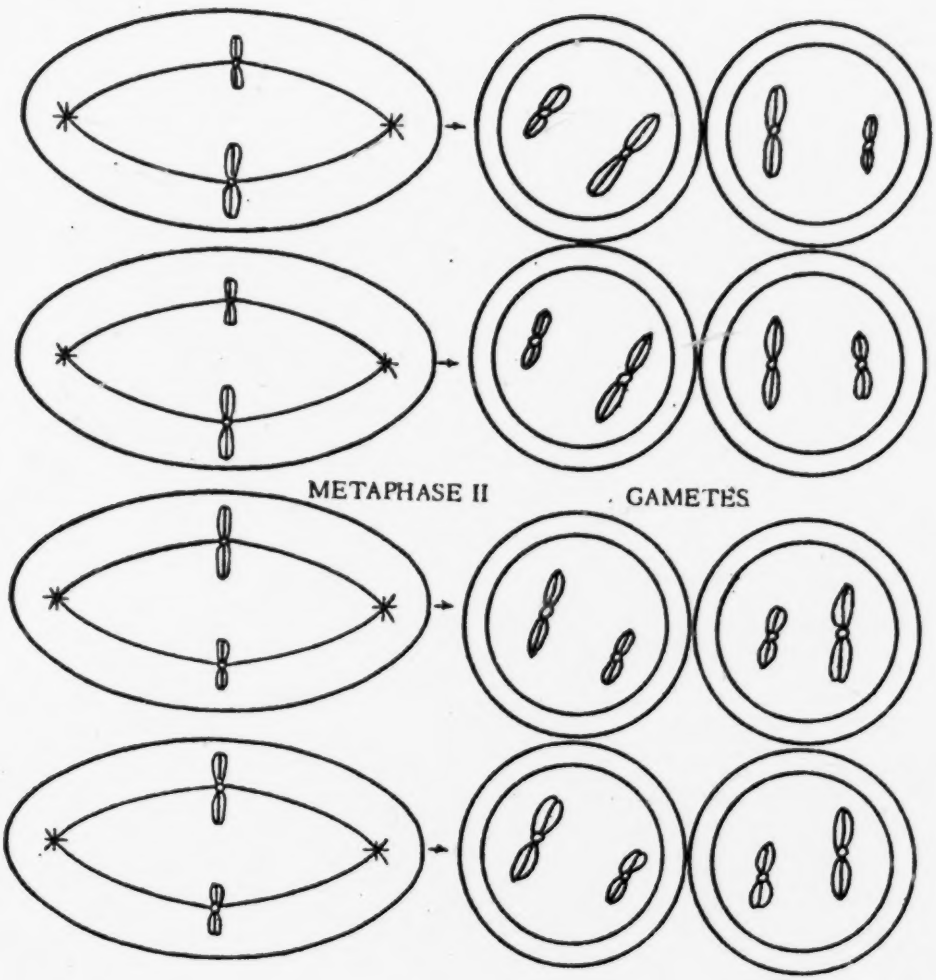
II. SUMMARY OF HORMONE BALANCE IN THE MENSTRUAL CYCLE*



MEIOSIS

1. For comparison of the two methods of division, use colored pencils to show the progress of two pairs of chromosomes through meiosis.




METAPHASE II
GAMETES

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BEHAVIORAL OBJECTIVE -- Week Five

GENETICS

General objective: Relate the principles of meiosis to the principles of genetics.

NOTES:

BE ABLE TO:

1. Define or recognize a description of the terms of genetics in your syllabus.
2. Give examples of all the terms of genetics listed in your syllabus and workbook.
3. Demonstrate your understanding of meiosis by listing what type of gametes will be produced from a given spermatogonium or obgonium.
4. Use the punnett square in solving genetics problems.
5. Use the sequential steps for genetics problem analysis in practical problem solving, exercises, which will be given on tape or GAS.
6. Solve genetics problems as in your workbook and handouts such as:
   A. Monohybird crosses
   B. Dihybrid crosses
   C. Sex-linkage
   D. Pedigrees

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BEHAVIORAL OBJECTIVE -- Week Six

CIRCULATION -- Heart structure & function

BE ABLE TO:

NOTES:

1. Label diagrams (or recognize a description) of the heart using the terms listed in your syllabus beginning on page 70.

2. Identify the structures of the heart, as indicated in your syllabus, on the following:

   A. Heart in your carrel
   B. Beef or sheep heart dissected in lab
   C. D-G test sheets
   D. Classroom charts
   E. Models in demonstration area

3. Trace the pathway of blood flow from the superior and inferior vena cavas to the aorta and name the structure which occur in this pathway.

4. Trace the heart impulse from its origin to the point of contraction and list the effects produced on the heart muscle and pressure changes.

5. Use a stethoscope and listen to the heart sounds in differentiating between the closure of the semilunar and atrioventricular valves.

6. Interpret and analyze an EKG tracing both normal and abnormal.

7. Relate the following concepts by identifying the effect each has on heart beat and rhythm:

   A. Law of the heart
   B. Heart diseases or disorders
   C. Nervous control

8. Set up a kymograph and perform the experiments as outlined beginning on page 232.

9. Interpret results that will be obtained with the aid of a physiograph in the demonstration by the instructor.

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BEHAVIORAL OBJECTIVE -- Week Seven

CIRCULATION - VASCULAR STRUCTURE

BE ABLE TO:

1. Differentiate between functions and identification of arteries and veins.
2. Differentiate between the microstructure of arteries, veins, and lymphatics.
3. Locate the arteries, veins and lymphatics as listed in your syllabus beginning on page 71, on the following:
   A. D-G test sheets
   B. Fetal pig or cat
   C. Classroom charts
   D. Applicable demonstration models
4. Identify the location of arteries, veins, and lymphatics by description.
5. View the microcirculation of the vascular system by using the frog foot.
6. Contrast the relationship and difference between adult and fetal circulation.
7. Explain or answer objective questions concerning the circulatory system of the placenta.

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BEHAVIORAL OBJECTIVE -- Week Eight

CIRCULATION - FUNCTION

BE ABLE TO:

NoTes:

1. List the components of the vascular fluid and identify the function of each.

2. Differentiate between erythrocytes, lencocytes, and thrombocytes according to the following:
   A. Number of cells per cumm
   B. Size and morphocogical appearance
   C. Embryonic origin
   D. General function

3. Differentiate between blood types A, B, D, & AB according to :
   A. Antigen type
   B. Natural antibody
   C. Donor capabilities
   D. Recipient capabilities
   E. Population distribution

4. Demonstrate your knowledge of Rh blood types by analyzing problems involving:
   A. Rh antigens
   B. Conditions under which Rh incompatibilities exist
   C. Problems which may arise from Rh incompatibilities.
   D. Transfusion problems of Rh antigens
   E. Sub-Rh groups

5. List and identify the cause of blood disorders attributable to erythrocythes as given in Guyton.

6. List and describe steps of the blood coagulation reaction and list diseases affecting clotting reaction.

7. Demonstrate your understanding of the coagulation reaction by identifying the effect of the following in specified body conditions:
   A. Heparin
   B. Thrombin
   C. Platelets
   D. Prothrombin
   E. Vitamin K
   F. Calicum and oxalate salts

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BEHAVIORAL OBJECTIVE -- Week Nine

CIRCULATION - Functions

BE ABLE TO :

1. Differentiate between the different types of leucocytes recording to:
   A. Microstructure
   B. Frequency of occurrance
   C. Function
2. List and identify the cause of blood disorders attributable to leucocytes as given in Guyton.
3. Differentiate between antigen and antibody and describe different ways in which an antigen and antibody may react.
4. Explain and answer objective questions about the Scientific American article entitled "How Cells Attack Antigens", Feb. 1964 and Life article, Feb. 18, 1966.
5. Differentiate between a homograft, autograft, and heterograft.
6. Differentiate and give examples of the following:
   A. Natural and specific immunity
   B. Tissue and humoral immunity
   C. Active and passive immunity
7. Identify the role of the thymus by recognizing its roll in transplants and the immune response.
8. Relate the problems of allergies to the immune response and give examples.
9. Define and give examples (or identify the effect) of the principles of hemodynamics in the following and solve problems demonstrating interrelationships:
   A. Blood flow and cardiac output
   B. Blood pressure
   C. Resistance to blood flow
   D. Relationship of pressure, flow, and resistance
10. List ways in which the blood flow is regulated through the vessels.

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Notes:

11. Relate the principles of hemodynamics to the special areas of the circulation, such as:
    A. Pulmonary circulation
    B. Coronary Circulation
    C. Cerebral circulation
    D. Portal circulation
    E. Muscle circulaton
    F. Skin circulation

12. Define mean arterial pressure, calculate mean arterial pressure from date provided, and list factors effecting arterial pressure. (eg. Kidney and hypertension)

13. Measure systolic and diastolic blood pressure

14. Define the following disorders and give or identify examples:
    A. Cardiac failure
    B. Circulatory shock

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BEHAVIORAL OBJECTIVE -- WEEK ELEVEN

RESPIRATION -- Structure

BE ABLE TO:

NOTES:

1. Locate and recognize a description of the respiratory structures, as listed in your syllabus, by using the following:
   - A. D-G Charts (T300, T241)
   - B. Frohse anatomy charts
   - C. Turtox anatomy charts
   - D. Mannequin
   - E. Fetal pig and/or cat
   - F. Preserved lamb pluck
   - G. Classroom models
2. List and identify the application of the gas laws to the respiratory function. (eg. Avogadro's Number, Boyle's Law, Charles' Law, Dalton's Law of Partial Pressures, Henry's Law).
3. Identify the functions of the major sections of the respiratory system, such as the nose, pharynx, larynx and vocal cords.
4. Relate the pressures of air in the Thoracic Cavity, including the lung, to the process of expiration and inspiration.
5. Identify the lung volumes by description and give the volume of air contained or exchanged in each.
6. Draw the chemical equations and describe the process by which respiratory gases are transported in the blood and exchanged between the blood and tissues.
7. Draw the oxygen -- hemaglobin dissociation curve and describe it in terms of oxygen transport and release.
8. Distinguish between the following three related curves:
   - A. Oxygen - hemoglobin dissociation curve
   - B. Oxygen - myoglobin dissociation curve
   - C. Fetus oxygen - hemoglobin dissociation curve

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9. Trace the Hering-Brewer reflex and identify its role in respiratory control and rhythm.

10. Recognize the various precesses in regulation of alvcolar ventilation as given in Guyton beginning on page 238.

11. Relate the principles of the gas laws to the effects of barometric changes produced by aviation, space, and deep sea diving, and identify methods by which the body becomes acclimated to these changes.

12. List the respiratory disorders as will be identified for you and identify the anatomical or physiological cause of each.

13. List and describe the direct effects of smoking on the body.

14. Solve all problems in your workbook and define all terms in your syllabus.

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BEHAVIORAL OBJECTIVE -- Week Twelve

BRAIN - NERVE STRUCTURE AND FUNCTION

BE ABLE TO:

1. Summarize the general basic plan of the nervous system by differentiating between the Central Nervous System (CNS), the Peripheral Nervous System (PNS), and the Autonomic Nervous System (ANS).
2. Label, draw, and identify the generalized representation of a neuron.
3. Differentiate between the various types of neurons composing nerves as to structure, function, and location as illustrated in Crouch page 498, D-G Chart T350, and Turtox classroom charts.
4. Relate the principles discussed in muscle contraction to the process of nerve conduction as presented in pages 58-68 of Guyton.
5. Use the kymograph and physiograph in producing and analyzing nerve conduction.
6. List the embryonic regions of the brain and identify the derivatives of each region in the mature brain.
7. Identify the major regions of the brain, as listed in your syllabus, on the classroom charts, models, mannequin, quiz sheets, preserved brain specimens, and slides.
8. List and identify the function of each region of the brain as identified in objective #6.
9. Identify the 12 cranial nerves with respect to the name, location, and function.
10. Solve and answer all workbook problems as given on pages 265-287 pertaining to this section.
11. Identify the regions of the somesthetic area of the brain and its specific role in interpretation of body sensations.
12. List different types of pain and the interpretation process of pain by the body as given in Guyton page 278-282.

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BEHAVIORAL OBJECTIVE -- Week Thirteen

SPINAL CORD AND ANS

BE ABLE TO:

1. Identify the structures of the spinal cord, which are listed in your syllabus, on the models and charts to be provided.
2. Differentiate between the sympathetic nervous system and parasympathetic nervous system according to function.
3. Relate the peripheral nervous system to the ANS according to the anatomical location and functions.
4. Trace the pathway of the typical simple reflex and identify the functions of the five structures composing the pathway.
5. List the various types of reflexes (eg. simple, complex) differentiate between them according to the pathway of each reflex.
6. Perform and solve the problems in your workbook pertaining to reflexes and their actions.
7. Answer objective questions from Guyton page 341-354.

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BEHAVIORAL OBJECTIVE -- Week Fifteen

HEARING, TASTE, and SMELL

BE ABLE TO:

1. Identify the structures of the ear on models and charts to be provided.
2. Describe or identify the function of each structure of the hearing apparatus.
3. List several disorders of the ear and give the function of each.
4. Differentiate between the four sensations of taste according to structure, location, and function, and perform lab tests which will map the taste sensations of the tongue.
5. Identify smell receptors according to location, structure, and function.
6. Differentiate between the seven (7) sensations of smell, and perform lab test regarding smell.

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